DOCUMENT RESUME

ED 326 406 SE 051 765

AUTHOR Cadoree, Michelle, Comp.
TITLE The Crisis in Science Education. LC Science Tracer Bullet.
INSTITUTION Library of Congress, Washington, D.C. National Referral Center for Science and Technology.
REPORT NO ISSN-0090-5232; LC-TB-90-5
PUB DATE Aug 90
NOTE 15p.
PUB TYPE Reference Materials - Bibliographies (131)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Conference Proceedings; *Educational Improvement; *Educational Trends; Elementary Secondary Education; Government Role; Reference Materials; Resource Materials; *Science Education; *Secondary School Science

ABSTRACT

In the early 1980's a number of reports on the status of science and mathematics education were published, making evident declining science and mathematics achievement, dropping enrollment, and a shortage of qualified teachers. In April 1983 the National Commission on Excellence in Education presented its report to President Reagan. The report, entitled "A Nation at Risk: The Imperative for Educational Reform," compared the quality of teaching and learning in schools and colleges in the United States with those of other advanced nations. The report became the focus of nationwide media attention. This sparked renewed federal involvement in science and mathematics education, school/industry coalitions were set up, and a call for help was issued to all interested parties. Concerned with the scientific literacy of their employees and their future employees, business and industry offered assistance in a number of ways. This guide is designed to complement other bibliographies on the topic and is not meant as a comprehensive bibliography on the topic. Categories include: (1) "Introductions to the Topic"; (2) "Subject Headings"; (3) "Basic Texts"; (4) "Related and Specialized Texts"; (5) "Bibliographies"; (6) "Selected Conference Proceedings"; (7) "Statistical Information"; (8) "Selected Statistical Sources"; (9) "Government Publications and Reports"; (10) "Selected Government Publications and Reports"; (11) "Abstracting and Indexing Services"; (12) "Journals"; (13) "Representative Articles"; (14) "Selected Materials"; and (15) "Sources of Additional Information." (CW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED326406

LC Science Tracer Bullet

Science Reference Section, Science and Technology Division
Library of Congress, 10 First Street, S.E., Washington, D.C. 20540

ISSN 0090-5232

THE CRISIS IN SCIENCE EDUCATION

Compiled by Michelle Cadoree

TB 90-5 August 1990

SCOPE: In the early 1980's a number of reports on the status of science and mathematics education were published, making evident declining science and mathematics achievement, dropping enrollment, and a shortage of qualified teachers. In April 1983 the National Commission on Excellence in Education presented its report to President Reagan. The report, entitled **A Nation at Risk: the Imperative for Educational Reform**, compared the quality of teaching and learning in America's schools and colleges with those of other advanced nations. **A Nation at Risk** became the focus of nationwide media attention. This sparked renewed federal involvement in science and mathematics education, school/industry coalitions were set up, and a call for help was issued to all interested parties. Concerned with the scientific literacy of their employees and their future employees, business and industry offered assistance in a number of ways--providing money, training, equipment, competitions, and other cooperative efforts.

This present guide complements LC Science Tracer Bullet 75-5, **Science Education in America**, which provides a historical overview. Not meant to be a comprehensive bibliography, this is designed--as the name of the series implies--to put the reader "on target."

INTRODUCTIONS TO THE TOPIC

Johnston, Karen L., and Bill G. Aldridge. The crisis in science education: what is it? how can we respond? **Journal of college science teaching**, v. 14, Sept./Oct. 1984: 20-28. **Pamphlet box*** and **Q183.U6J68**

Press, Frank. Closing in on the math and science gap. In **Science year**. Chicago, World Book, Inc., 1985. p. 198-209. **Pamphlet box*** and **Q9.S33 1985***

Seaborg, Glenn T. The crisis in pre-college science and math education. **Skeptical inquirer**, v. 14, spring 1990: 270-275. **BF1001.S47**

* **Available in reference collection, Science Reading Room**

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
✓ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

United States. Congress. Office of Technology Assessment. **Educating scientists and engineers: grade school to grad school.** Washington, U.S. Govt. Print. Off., 1988. 128 p. **Q183.3.A1E38 1988***

"OTA-SET-377."

Examines the forces associated with elementary and secondary education that shape the talent pool, traces pathways to undergraduate and graduate education in science and engineering, and presents a discussion of policy areas for possible congressional action, developed under two strategies, labeled 'retention' and 'recruitment.'

SUBJECT HEADINGS used by the Library of Congress, under which books on science education can be located in the Library's card, book, and online catalogs, include the following:

SCIENCE AND STATE--UNITED STATES (Highly relevant)
SCIENCE--STUDY AND TEACHING (ELEMENTARY)--UNITED STATES (Highly relevant)
SCIENCE--STUDY AND TEACHING (HIGHER)--UNITED STATES (Highly relevant)
SCIENCE--STUDY AND TEACHING (SECONDARY)--UNITED STATES (Highly relevant)
See also specific disciplines, e.g., ENGINEERING, MATHEMATICS, TECHNOLOGY followed by the subdivisions --STUDY AND TEACHING--UNITED STATES
SCIENCE--STUDY AND TEACHING (Relevant)
SCIENCE--STUDY AND TEACHING--LAW AND LEGISLATION--UNITED STATES (Relevant)
SCIENCE--STUDY AND TEACHING--UNITED STATES (Relevant)
SCIENTISTS--EDUCATION--UNITED STATES (Relevant)
TECHNOLOGY AND STATE--UNITED STATES (Relevant)
EDUCATION AND STATE--UNITED STATES (Related)
SCIENTISTS--SUPPLY AND DEMAND--GOVERNMENT POLICY--UNITED STATES (Related)
TECHNICAL EDUCATION--UNITED STATES (Related)
EDUCATION--UNITED STATES--EVALUATION (More general)

BASIC TEXTS

Criteria for excellence. Washington, National Science Teachers Association, c1987. 39 p. **Q183.3.A1C75 1987**

Development and dilemmas in science education. Edited by Peter Fensham. London, New York, Falmer Press, 1988. 318 p. (Contemporary analysis in education series, 23) **Q121.D48 1988**

Everybody counts: a report to the nation on the future of mathematics education. Mathematical Sciences Education Board and Board on Mathematical Sciences, Committee on the Mathematical Sciences in the Year 2000, National Research Council. Washington, National Academy Press, 1989. 114 p. **QA13.E94 1989**
Bibliography: p. 99-113.

National Science Board (U.S.). Commission on Precollege Education in Mathematics, Science, and Technology. **Educating Americans for the 21st century: a plan of action for improving mathematics, science, and technology education for all American elementary and secondary students so that their achievement is the best in the world by 1995: a report to the American people and the National Science Board.** Washington, National Science Board Commission on Precollege Education in Mathematics, Science, and Technology, 1983. 124 p. **QA13.N38 1983** SSRR
Bibliography: p. 102-103.
----- ----- Source materials. Washington, National Science Board Commission on Precollege Education in Mathematics, Science, and Technology, 1983. 251 p.
QA13.N38 1983 Source Materials SSRR

Project 2061. Phase I of the AAAS initiative on scientific literacy, Project 2061 established a base for reform by spelling out the knowledge, skills, and attitudes that all students should acquire as a consequence of their total school experience from kindergarten through high school. The following six reports, listed in order of AAAS publication number, are the product of Phase I of Project 2061.

Science for all Americans: a Project 2061 report on literacy goals in science, mathematics, and technology. Washington, American Association for the Advancement of Science, 1989. 217 p. (AAAS publication, 89-01S)
Bibliography: p. 195-199. **Q183.3.A1S355 1989***

Clark, Mary E. **Biological and health sciences: report of the Project 2061 Phase I Biological and Health Sciences Panel.** Washington, American Association for the Advancement of Science, 1989. 33 p. (AAAS publication, 89-02S)
Q181.A1A68, no. 89-02S

Project 2061 (American Association for the Advancement of Science). Phase I Mathematics Panel. **Mathematics: report of the Project 2061 Phase I Mathematics Panel.** David Blackwell and Leon Henkin [panel cochairs]. Washington, American Association for the Advancement of Science, 1989. 47 p. (AAAS publication, 89-03S) **Q181.A1A68, no. 89-03S**

SSRR = Social Science Reading Room

Project 2061 (American Association for the Advancement of Science). Phase I Physical and Information Sciences and Engineering Panel. **Physical and information sciences and engineering: report of the Project 2061 Phase I Physical and Information Sciences and Engineering Panel.** George Bugliarello [panel chair]. Washington, American Association for the Advancement of Science, 1989. 41 p. (AAAS publication, 89-04S) **Q181.A1A68, no. 89-04S**

Appley, Mortimer H., and Winifred B. Maher. **Social and behavioral sciences: report of the Project 2061 Phase I Social and Behavioral Sciences Panel.** Washington, American Association for the Advancement of Science, 1989. 55 p. (AAAS publication, 89-05S) **Q181.A1A68, no. 89-05S**
Includes bibliographical references.

Johnson, James R. **Technology: report of the Project 2061 Phase I Technology Panel.** Washington, American Association for the Advancement of Science, 1989. 32 p. (AAAS publication, 89-06S) **Q181.A1A68, no. 89-06S**

Science & engineering education for the 1980's & beyond. Prepared by the National Science Foundation & the Department of Education. Washington, The Foundation, U.S. Govt. Print. Off., 1980. 82 p. **Q183.3.A1S35**
Includes bibliographies.

RELATED AND SPECIALIZED TEXTS

Alliance for excellence: librarians respond to A Nation at Risk: recommendations and strategies from libraries and the learning society. Washington, U.S. Dept. of Education, Office of Educational Research and Improvement, Center for Libraries and Education Improvement; U.S. Govt. Print. Off., 1984. 64 p. **Z718.A36 1984**

American Council on Education. Business-Higher Education Forum. **America's competitive challenge: the need for a national response. A report to the President of the United States from the Business-Higher Education Forum.** Washington, American Council on Education, Business-Higher Education Forum, 1983. 51 p. **LC1085.A45 1983**
Includes bibliographical references.

America's schools: passing the test of the 80's? Editor, Carol C. Collins. New York, Facts on File Publications, c1985. 231 p. **LA217.A785 1985**
A compilation of newspaper editorials that follow the debate over the crisis in education.

Blacks, science, and American education. Edited by Willie Pearson, Jr., and H. Kenneth Bechtel. New Brunswick. Rutgers University Press, c1989. 174 p.
Bibliography: p. 153-165. **Q149.U5B57 1989**

Committee on Science and Mathematics Education. **Recommendations for improving the quality of science and mathematics education in North Carolina's public schools.** Raleigh, N.C., Committee on Science and Mathematics Education of the North Carolina Board of Science and Technology and the State Dept. of Public Instruction, 1982. 70 p. **Q183.3.N8C66 1982**

Includes bibliographical references.

Lee, Valerie E., and Carolee Stewart. **National assessment of educational progress proficiency in mathematics and science, 1985-86: Catholic and public schools compared: final report 1989.** Washington, National Catholic Educational Association, c1989. 66 p. **QA13.L44 1989**

Includes bibliographical references.

Libraries and the learning society: papers in response to A Nation At Risk. Richard M. Dougherty and others. Chicago, American Library Association, 1984. 146 p. **Z675.S3L44 1984**

United States. Dept. of Education. **The nation responds: recent efforts to improve education.** Washington, U.S. Govt. Print. Off., 1984. 229 p. **LA217.U54 1984**

BIBLIOGRAPHIES

Gratch, Bonnie G. Five years after A Nation at Risk: an annotated bibliography. **RSR: reference services review**, v. 17, winter 1989: 29-48. **Z1035.1.R43 and Pamphlet box***

Schroeder, Eileen E. **Science education.** Phoenix, Ariz., Oryx Press, 1986. 103 p. (Oryx science bibliographies, 6) **Z5818.S3S34 1986***

SELECTED CONFERENCE PROCEEDINGS

High-school biology: today and tomorrow. Committee on High-School Biology Education, Board on Biology, Commission on Life Sciences, National Research Council. Walter G. Rosen, editor. Washington, National Academy Press, c1989. 346 p. **QH315.H615 1989**

Papers presented at a conference held Oct. 1988, Washington, D.C.

National Forum on Educational Reform (1984: San Francisco, Calif.). **Excellence in our schools: making it happen: conference proceedings of a National Forum on Educational Reform held in San Francisco, March 14-16, 1984.** New York, College Entrance Examination Board, 1985. 95 p. **LA210.N3335 1984**

Natural partners: how science centers and community groups can team up to increase science literacy. Washington, Association of Science-Technology Centers, 1987. 23 p. **Q105.U5N38 1987**

Proceedings of a workshop held in September 1986; sponsored by ASTC and the American Association for the Advancement of Science, Office of Opportunities.
Bibliography: p. 18.

Raizen, Senta A. **Science and mathematics in the schools: report of a convocation.** Washington, National Academy of Sciences, National Academy of Engineering, 1982. 32 p. **Q183.3.A1R34 1982**

Science and technology education and future human needs. Edited by J. L. Lewis and P. J. Kelly. Oxford, Eng., New York, Published for the ICSU Press by Pergamon Press, 1987. 185 p. (Science and technology education and future human needs, v. 1.) **Q181.S82 1987**

Papers from the Bangalore Conference on Science and Technology Education and Future Human Needs, organized by the Committee on the Teaching of Science of the International Council of Scientific Unions.
Includes bibliographies.

Science education in a high technology society: proceedings of a conference. Sponsored by Boston University for the National Science Teachers Association of the United States and the Association for Science Education of the United Kingdom, March 31-April 2, 1984, Boston, Massachusetts. Edited by Albert G. Medvitz. Boston, Boston University, c1985. 335 p. **Q181.A1S35 1985**

Includes bibliographies.

STATISTICAL INFORMATION can be located in the following indexes:

American Statistics Index (1974-) Z7554.U5A46 MicRR, N&CPR, SSRR
See: Higher Education
Scientific Education
Vocational Education and Training

Statistical Reference Index (1980-) Z7554.U5S73 MRR, MicRR, N&CPR, SSRR
See: Scientific Education
Technical Education
Vocational Education and Training

MicRR = **Microform Reading Room**
MRR = **Main Reading Room**
N&CPR = **Newspaper and Current Periodicals Reading Room**

SELECTED STATISTICAL SOURCES

Science & engineering indicators. Washington, National Science Board, U.S. Govt. Print. Off., 1987- **Q172.5.S34S34***
Continues **Science Indicators** (1972-1986) Q172.5.S34S36

Science and technology data book. Washington, National Science Foundation, Division of Science Resources Studies, 1983- **Pamphlet box***
Distributed annually by NTIS in its PB series, e.g., 1989 edition, PB89-231765**

GOVERNMENT PUBLICATIONS AND REPORTS can be located in the following indexes:

CIS Index to Publications of the United States Congress (1970-) KF49.C62 MicRR, N&CPR, SSRR
See: Engineering
Federal Aid to Education
Mathematics
Scientific Education

Government Reports Announcements & Index (1946-) Z7916.G78*
See: Engineering Education
Mathematics Education
Science Education

Monthly Catalog of United States Government Publications (1895-) Z1223.A18* N&CPR
See: Education--Science
Engineering--Study and Teaching--United States
Mathematics--Study and Teaching--United States
Science--Study and Teaching--United States
Science--Study and Teaching (Higher)--United States
Science--Study and Teaching (Secondary)--United States
Science and State--United States
Science Teachers--United States--Supply and Demand

Resources in Education (RIE) (1966-) Z5813.R4 SSRR
See: Science Education
Science Teachers
Scientific Literacy

** Available in the microform collection, Science Reading Room

SELECTED GOVERNMENT PUBLICATIONS AND REPORTS

Davey, Micheal E., Edith Fairman Cooper, and Christine Matthews Rose. **Brick and mortar: a summary and analysis of proposals to meet research facilities needs on college campuses: report prepared by the Congressional Research Service, Library of Congress, for the Subcommittee on Science, Research, and Technology; transmitted to the Committee on Science, Space, and Technology, House of Representatives, One Hundredth Congress, first session.** Washington, U.S. Govt. Print. Off., 1987. 160 p.
Q180.6.U54D38 1987

Equity and excellence: a dual thrust in mathematics and science education. Model state education agency efforts. Washington, Council of Chief State School Officers, 1987. 35 p. **ED 289 721****

Sang, Herb A. **Closing the education gap: a Mayo Clinic approach to academic achievement.** [Jacksonville, Fla., 1987?] 13 p. **ED 288 235****
Paper presented at the annual meeting of the American Association of School Administrators, New Orleans, La., Feb. 20-23, 1987.

United States. Congress. House. Committee on Science and Technology. **H.R. 1310, Emergency Mathematics and Science Education Act: hearings before the Committee on Science and Technology, House of Representatives, Ninety-eighth Congress, first session, February 9, 16, 1983.** Washington, U.S. Govt. Print. Off., 1984. 329 p.
KF27.S39 1983f

United States. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research, and Technology. **Science and math education: hearing before the Subcommittee on Science, Research, and Technology of the Committee on Science and Technology, U.S. House of Representatives, Ninety-eighth Congress, second session, February 10, 1984.** Washington, U.S. Govt. Print. Off., 1984. 231 p.
KF27.S399 1984e

United States. Congress. House. Committee on Science, Space, and Technology. Subcmmittee on Science, Research, and Technology. **Scientific and technical literacy in the work force: hearing before the Subcommittee on Science, Research, and Technology, House of Representatives, One Hundredth Congress, first session, November 9, 1987.** Washington, U.S. Govt. Print. Off., 1988. 329 **KF27.S399 1987k**

United States. Congress. Office of Technology Assessment. **Elementary and secondary education for science and engineering: a technical memorandum.** Washington, U.S. Govt. Print. Off., 1988. 146 p. **LB1585.C44 1990**
Augments OTA's report, **Educating Scientists and Engineers: Grade School to Grad School**, focusing on the factors that prompt students to plan science and engineering careers during elementary and secondary education, and the early stages of higher education.

United States. Congress. Senate. Committee on Labor and Human Resources. **Federal leadership in science: hearing before the Committee on Labor and Human Resources, United States Senate, One Hundred First Congress, first session, on examining the federal government's role in scientific research, education, and innovation, April 6, 1989.** Washington, U.S. Govt. Print. Off., 1989. 84 p. (S. hrg. 101-49) **KF26.L27 1989g**

----- **Review of mathematics and science education programs, 1983: hearing before the Committee on Labor and Human Resources, U.S. Senate, Ninety-eighth Congress, first session, on to review mathematics and science education in primary and secondary schools, focusing on the role that the National Science Foundation should play in a national effort to improve these education programs, April 18, 1983.** Washington, U.S. Govt. Print. Off., 1984. 171 p. (S. hrg. 98-524) **KF26.L27 1983u**

United States. General Accounting Office. **New directions for federal programs to aid mathematics and science teaching:** report. Washington, The Office, 1985. 86 p. "GAO/PEMD-84-5." **QA13.U55 1985**

United States. National Commission on Excellence in Education. **Meeting the challenge: recent efforts to improve education across the nation: a report to the Secretary of Education.** Prepared by the staff of the National Commission on Excellence in Education. Washington, U.S. Dept. of Education, 1983. 125 p. **LA217.U49 1983a**

----- **A nation at risk: the imperative for educational reform: a report to the Nation and the Secretary of Education, United States Department of Education.** Washington, The Commission; U.S. Govt. Print. Off., distributor, 1983. 65 p. **LA217.U49 1983**

ABSTRACTING AND INDEXING SERVICES that index literature relating to science education are listed below. Some suggested terms are given as aids in searching.

Applied Science & Technology Index (1913-) Z7913.I7* and CD-ROM*
See: Education--United States
Elementary Education
Engineering Education
Education and Industry

Current Index to Journals in Education (1969-) Z5813.C8 SSRR
See: Science Education
Science Instruction
Science Instructors
Scientific Literacy

Note: Consult reference librarian for location of abstracting and indexing services in the Science Reading Room.

Education Index (1929-) Z5813.E23 SSRR
See: Science--Curriculum
Scientific Literacy

General Science Index (1978-) Z7401.G46*
See: Education--United States
Science--Social Aspects
Science and State--United States
See also subheading 'Study and Teaching' under specific subject disciplines, e.g. Engineering--Study and Teaching.

Readers' Guide to Periodical Literature (1900-) AI3.R48 SSRR
See: Science--Study and Teaching
Science and State
Scientific Literacy

JOURNALS that often contain articles relevant to science education in the United States include:

Journal of College Science Teaching Q183.U6J68
Journal of Research in Science Teaching Q181.A1J6
Phi Delta Kappan LJ121.P4
School Science and Mathematics Q1.S28
Science Q1.S35
Science Education Q1.S385
Science Teacher Q181.S35

REPRESENTATIVE ARTICLES

Bloch, Erich. Basic research and economic health: the coming challenge. **Science**, v. 232, May 2, 1986: 595-599. **Q1.S35**

Blosser, Patricia E. What research says: achievement in science. **School science and mathematics**, v. 84, Oct. 1984: 514-521. **Q1.S28**

Brown, George E. Project 2061: a congressional view. **Science**, v. 245, July 28, 1989: 340. **Q1.S35**

Bybee, Rodger, and Robert E. Yager. Perceptions of professional problems, proposed solutions and needed directions in science education. **School science and mathematics**, v. 82, Dec. 1982: 673-681. **Q1.S28**

Cowley, Geoffrey, and others. Not just for nerds. **Newsweek**, v. 115, Apr. 9, 1990: 52-54. **AP2.N6772**
Facts about America's standing in science education.

Green, Kenneth C. A profile of undergraduates in the sciences. **American scientist**, v. 77, Sept./Oct. 1989: 475-480. **LJ85.S502**

Hanson, David. Corporate, federal cooperation to improve science education urged. **Chemical & engineering news**, v. 67, May 8, 1989: 22-23. **TP1.C35**

Holden, Constance. Companies move to rescue school science. **Science**, v. 225, Sept. 28, 1984: 1456-1457. **Q1.S35**

Hurd, Paul DeHart. Perspectives for the reform of science education. **Phi Delta Kappan**, v. 67, Jan. 1986: 353-358. **LJ121.P4**

Kleppner, Daniel. Is U.S. science slipping from first place? **Technology review**, v. 89, May/June 1986: 24-25, 78. **T171.M47**

Kormondy, Edward J. Science education: the challenge of the 80s. **American biology teacher**, v. 47, Oct. 1985: 402-409. **QH1.A275**

Krieger, James. Past decade shows no gain in U.S. science literacy. **Chemical & engineering news**, v. 67, Jan. 30, 1989: 24-26. **TP1.C35**

----- ACS presents science education report to Congress. **Chemical & engineering news**, v. 67, Nov. 27, 1989: 54-55. **TP1.C35**

Levin, Henry M. Solving the shortage of mathematics and science teachers. **Educational evaluation and policy analysis**, v. 7, winter 1985: 371-382. **LB1028.E29**

Massey, Walter E. Science education in the United States: what the scientific community can do. **Science**, v. 245, Sept. 1, 1989: 915-921. **Q1.S35**

Ploch, Margie. Rebuilding math and science education: business lends a hand. **High technology**, v. 4, Oct. 1984: 69-72. **T1.H5**

Pool, Robert. Who will do science in the 1990s? **Science**, v. 248, Apr. 27, 1990: 433-435. **Q1.S35**

Scientific literacy. [Boston, Mass.] American Academy of Arts and Sciences, 1983. 251 p. (**Daedalus**, v. 112, spring 1983) **Q11.B7, v. 112**

Contents: Scientific literacy and economic productivity in international perspective, by H. J. Walberg.--Scientific literacy: a conceptual and empirical review, by J. D. Miller.--Scientific illiteracy and democratic theory, by K. Prewitt.--Nature closely observed, by D. Hawkins.--Achieving wider scientific literacy, by A. B. Arons.--Science education: a framework for decision-makers, by M. B. Rowe.--The reform of science education: a cautionary tale, by P. W. Jackson.--The improvement of science teaching, by J. M. Atkin.--Human genetics; one approach to scientific literacy, by B. Childs and F. Hickman.--The case of computer literacy, by J. G. Kemeny.--Nothing to fear, much to do, by S. R. Graubard.

Stata, Ray. The engineering education crisis. **New England business**, v. 5, May 16, 1983: 20, 79-80, 82-83. **HC107.A11N28**

Urrows, Henry, and Elizabeth Urrows. In a bad way ... the condition of high school mathematics and physics. **College board review**, no. 140, summer 1986: 16-19, 30-36. **LB2353.C55**

Vagelos, P. Roy. The sorry state of science education. **Scientific American**, v. 261, no. 4, Oct. 1989: 128. **T1.S5**

Worthy, Ward. AAAS offers guidelines to combat scientific illiteracy problem. **Chemical & engineering news**, v. 67, March 13, 1989: 22-24. **TP1.C35**

Yager, Robert E. Searching for excellence. **Journal of research in science teaching**, v. 23, Mar. 1986: 209-217. **Q181.A1J6**

SELECTED MATERIALS available in the Science Reading Room pamphlet box collection include:

Buccino, Alphonse. The condition of science education. **Appraisal**, v. 17, fall 1984: 4-12.

Gardner, Marjorie H., and Robert E. Yager. Science education: restoration at the precollege level. **Journal of college science teaching**, v. 13, Sept./Oct. 1983: 44-49.

Matthews, Westina, and others. The third national assessment: minorities and mathematics. **Journal for research in mathematics education**, v. 15, Mar. 1984: 165-171.

NSTA position statement: preschool and elementary level science education. In **NSTA handbook 1989-90**. [Washington, National Science Teachers Association, 1989?] p. 60-61.

NSTA position statement: science education for middle level students. In **NSTA handbook 1989-90**. [Washington, National Science Teachers Association, 1989?] p. 62-65.

NSTA position statement: science-technology-society: science education for the 1980s. In **NSTA handbook 1989-90**. [Washington, National Science Teachers Association, 1989?] p. 55-58.

Rumberger, Russell. The shortage of mathematics and science teachers: a review of the evidence. **Educational evaluation and policy analysis**, v. 7, winter, 1985: 355-369.

Stefanich, Greg, and Charles Dedrick. Addressing concerns in science and mathematics education: an alternative view. **Clearing house**, v. 58, Feb. 1985: 274-277.

United States. Congress. Senate. Committee on Governmental Affairs. **Crisis in science and math education: hearing before the Committee on Governmental Affairs, United States Senate, One Hundred First Congress, first session, November 9, 1989.** Washington, U.S. Govt. Print. Off., 1990. 134 p. (S. Hrg. 101-561)

United States. Congress. House. Committee on Science, Space, and Technology. Subcommittee on Energy Research and Development. **Role of national laboratories in science, mathematics and engineering education. Hearing before the Subcommittee on Energy Research and Development of the Committee on Science, Space, and Technology, House of Representatives, One Hundred First Congress, first session, May 15, 1989.** Washington, U.S. Govt. Print. Off., 1990. 380 p.

United States. Congress. House. Committee on Science, Space, and Technology. Subcommittee on Science, Research and Technology. **Precollege science and mathematics education. Hearing before the Subcommittee on Science, Research and Technology of the Committee on Science, Space, and Technology, U.S. House of Representatives, One Hundred First Congress, second session, February 28, 1990.** Washington, U.S. Govt. Print. Off., 1990. 91 p.

United States. Congress. House. Committee on Science, Space, and Technology. Subcommitee on Science, Research and Technology. **Scientific, technical and literacy education and training and H.R. 3122, the Science and Technological Literacy Act. Hearing before the Subcommittee on Science, Research and Technology of the Committee on Science, Space, and Technology, U.S. House of Representatives, One Hundred First Congress, first session, October 31, 1989.** Washington, U.S. Govt. Print. Off., 1990. 235 p.

United States. Congress. House. Committee on Science, Space, and Technology. **Science and mathematics education: hearings before the Committee on Science, Space, and Technology, U.S. House of Representatives, One Hundred First Congress, first session, May 23, 24; June 7, 1989.** Washington, U.S. Govt. Print. Off., 1989. 499 p.

Walberg, Herbert J. Science, mathematics, and national welfare: retrospective and prospective achievements. In **International comparisons and educational reform.** Alexandria, Va., Association for Supervision and Curriculum Development, 1989. p. 99-111.

Woo, Louis K. The shortage of mathematics and science teachers: lessons from higher education. **Educational evaluation and policy analysis**, v. 7, winter, 1985: 383-393.

SOURCES OF ADDITIONAL INFORMATION

American Association for the Advancement of Science
Directorate for Education and Human Resources Programs
1333 H Street, NW
Washington, D.C. 20005
Telephone: (202) 326-6620
(Publishes **Sourcebook for Science, Mathematics & Technology Education** (formerly **AAAS Science Education Directory**) and **Science Education News**)

ERIC Clearinghouse for Science, Mathematics, and Environmental Education
Ohio State University
1200 Chambers Road
Columbus, Ohio 43212
Telephone: (614) 292-6717

National Science Foundation,
Directorate for Science Education
1800 G St, NW
Washington, D.C. 20550
Telephone: (202) 357-7557

National Science Teachers Association (NSTA)
1742 Connecticut Avenue, NW
Washington, D.C. 20009
Telephone: (202) 328-5800
(Publishes **NSTA Yearbook** and **NSTA Handbook**)